LESSON PLAN

DEPARTMENT: MATHEMATICS AND SCIENCE

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ACADEMIC SESSION:-2021-22

SEMESTER: - 1ST SEM WINTER-2021

SUBJECT: -ENGINEERING CHEMISTRY

SECTION-I

Discipline: ETC & AE&I Branch	Semester: 1st Semester	Name of the Teaching Faculty: Sasmita Swain Deepika Priyadarshini
Subject: Engineering Chemistry	No. of Days/ per week class allotted (Mon,Tue,Wed,Thu)	Semester From: - Date: _25 / 10 / 2021 to 31/ 01/2022 No of Weeks: - 15
Week	Class Dates	Theory Topics
1st	25.10.21 26.10.21 27.10.21 28.10.21	**Chapter 1: Atomic structure :** Fundamental particles (electron, proton & neutron Definition, mass and charge) .Rutherford's Atomic model (postulates and failure), Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones. Bohr's Atomic model (Postulates only), Bohr-Bury scheme, Aufbau's principle, Hund's rule, Electronic configuration (up to atomic no 30)
2nd	1.11.21 2.11.21 3.11.21	**Chapter 2 : Chemical Bonding :** Definition , types Electrovalent bond with examples (formation of NaCl, $MgCl_2$) Covalent bond with examples (formation of H_2,Cl_2, O_2, N_2, H_2O,CH_4, NH_3) Coordinate bond with examples (formation of NH_4^+, SO_2)
3rd	8.11.21 9.11.21 10.11.21 11.11.21	**Chapter 3 : Acid base theory :** Concept of Arrhenius, Lowry Bronsted (Postulates and limitations only). Lewis theory for acid and base with examples (Postulates and limitations only). Neutralization of acid & base. Definition of Salt, Types of salts (Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each.

		CLASS TEST-1
4th	15.11.21 16.11.21 17.11.21 18.11.21	**Chapter 4: Solutions :** Definitions of atomic weight, molecular weight, Equivalent weight. Determination of equivalent weight of Acid, Base and Salt. Modes of expression of the concentrations (Molarity , Normality & Molality) with Simple Problems.
5th	22.11.21 23.11.21 24.11.21 25.11.21	**Chapter 4: Solutions :** pH of solution (definition with simple numericals) Importance of pH in in **Chapter 5 :** **Electrochemistry :** Definition and types (Strong & weak) of Electrolytes with example. Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution). Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical) Industrial application of Electrolysis- Electroplating (Zinc only)dustry (sugar, textile, paper industries only
6th	29.11.21 30.11.21 1.12.21 2.12.21	**Chapter 6 : Corrosion:** Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization **CASSS TEST -2** **Chapter 7 : Metallurgy:** Definition of Mineral, ores , gangue with example.

		Distinction between Ores And Minerals
7th		**Chapter 7 : Metallurgy:**
	6.12.21	General methods of extraction of metals, (i) Ore Dressing
	7.12.21	,(ii)) Concentration (Gravity separation, magnetic separation, Froth floatation & Leaching)
	8.12.21	
	9.12.21	iii) Oxidation (Calcinations, Roasting) iv) Reduction (Smelting, Definition & examples of flux, slag).
		v) Refining of the metal (Electro refining, & Distillation only)
8th		**Chapter 8 : Alloys:** Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin
	13.12.21	
		Chapter 9 : Hydrocarbons :
	14.12.21 15.21.21	Saturated and Unsaturated Hydrocarbons (Definition with example) Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons
	16.12.21	IUPAC system of nomenclature of Alkane
9th		**Chapter 9 : Hydrocarbons :**
	20.12.21	IUPAC system of nomenclature of Alkane.
	21.12.21	IUPAC system of nomenclature of Alkene, Alkyne
	22.12.21	IUPAC system of nomenclature Alkene, Alkyne.
	23.12.21	IUPAC system of nomenclature of alkyl halide and alcohol (up to 6 carbons) with bond line notation

10th	27.12.21 28.12.21 29.12.21 30.12.21	**Chapter 9 : Hydrocarbons** Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life Previous year semester question discussion (IUPAC Nomenclature) **CLASS TEST-3**
11th	3.1.22 4.1.22 5.1.22 6.1.22	**Chapter 10 : Water Treatment :** Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate), Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages) , Advantages of Hot lime over cold lime process. Organic Ion exchange method (principle, process, and regeneration of exhausted resins)
12th	10.1.22 11.1.22 12.1.22 13.1.22	**Chapter 11 : Lubricants**: Definition of lubricant, Types (solid, liquid and semisolid with examples only) and specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication **Chapter 12 : Fuel**: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel. Liquid: Diesel, Petrol, and Kerosene --- Composition and uses. Gaseous: Producer gas and Water gas (Composition and uses). Elementary idea about LPG, CNG and coal gas (Composition and uses only

13th	17.1.22 18.1.22 19.1.22 20.1.22	**Chapter 13 : Polymer**: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization. Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene, & Poly-Vinyl Chloride and Bakelite. Definition of Elastomer (Rubber). Natural Rubber (it's draw backs). Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber **QUIZ TEST**
14th	24.1.22 25.1.22 27.1.22	**Chapter 14: Chemicals in Agriculture:** Pesticides: Insecticides, herbicides, fungicides- Examples and uses.Bio Fertilizers: Definition, examples and uses **Revision** **Exam related problem practice**
15th	31.1.22	**VST FOR SEMESTER EXAM**

REFERENCE BOOK:

1. Eng.Chemistry by Y.R.Sharma and P.Mitra, Kalyani Publishers.
2. Textbook of intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma Kalyani Publishers.